DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the salient pole form rotator provided with the ventilation flue which penetrates rotor winding to the shaft orientations of rotor winding.

[0002]

[Description of the Prior Art]Drawing 19 shows the conventional salient pole form ******** shown in JP,11-355991,A. In the figure, 1 is the cylindrical stator fixed by the support member 3 in the frame 2, and the stator winding 4 is formed. The yoke arranged by 5 extending in the stator 1 in shaft orientations and 6 are four magnetic pole iron cores attached to the yoke 5, and the suspending portion 6a is formed in the tip part. as for 7, tabular [which is the rotor winding wound around the magnetic pole iron core 6, and was laminated by turns via the insulating member (not shown)] is broad -- the conductor 7a and tabular are narrow -- it is constituted by the conductor 7b. 8 is narrow -- the sectional shape which countered the periphery of the conductor 7b and has been arranged is a U-shaped insulating block, and is broad -- as narrow as the conductor 7a -- it is adjusting for being so that it may not be generated with a level difference between peripheral faces with the conductor 7b.

[0003]The coil presser foot inclined so that 9 might be arranged between the adjacent rotor winding 7 and both ends might counter the rotor winding 7, As shown in drawing 20, the presser-foot board which 10 was formed with the insulating material and has been arranged between each end of the coil presser foot 9, and the rotor winding 7, and 8a, They are a ventilation flue by which it presses down with the insulating block 8 and is formed with the board 10 and through which cooling wind blows flow during the rotating operation of a salient pole form rotator, and the clamping bolt which 11 penetrates the coil presser foot 9, binds the coil presser foot 9 tight to the yoke 5, and is fixed, pressing down by the clamping force of the clamping bolt 11 -- the board 10 -- the insulating block 8 -- and broad -- by being pushed against the conductor 7a, modification of the rotor winding 7 by the component of a force of the centrifugal force generated in rotation of a salient pole form rotator is prevented. The salient pole form rotator is constituted by the above-mentioned yoke 5, the magnetic pole iron core 6, and the rotor winding 7.

[0004]Next, operation of the conventional salient pole form rotator constituted as mentioned above is explained. Generally, although temperature rises by generation of heat according [the rotor winding 7] to current for the rotating operation of a salient pole form rotator, It is constituted by the outside of a salient pole form rotator, i.e., the cooling wind blows which flow between the adjacent rotor winding 7, and the cooling wind blows which hit the shaft direction end face of the rotor winding 7 so that the rotor winding 7 may be cooled. However, since there was a problem that the cooling wind blows which flow between the adjacent rotor winding 7 were barred by the coil presser foot 9, and the chilling effect by cooling wind blows fell, the conventional salient pole form rotator, The ventilation flue 8a was formed with the presser-foot board 10 and the insulating block 8, and the rotor winding 7 was cooled by passing cooling wind blows to this ventilation flue 8a.

[0005]

[Problem(s) to be Solved by the Invention]Although the conventional salient pole form rotator was constituted as mentioned above and had cooled the rotor winding 7 by the cooling wind blows which flow through the ventilation flue 8a, Since the ventilation flue 8a pressed down with the insulating block

8 and was arranged between the boards 10 (i.e., the peripheral part of the rotor winding 7), the peripheral part of the rotor winding 7 was cooled efficiently, but there was a problem that the chilling effect of the inner periphery of the rotor winding 7 was bad, and was not cooled with sufficient balance of the rotor winding 7. This invention was made in order to cancel the above-mentioned problem, and an object of an invention is to provide the salient pole form rotator which can cool rotor winding with sufficient balance efficiently by passing cooling wind blows inside rotor winding.

[0006]

[Means for Solving the Problem]Two or more magnetic pole iron cores which a salient pole form rotator of this invention extended along with a yoke which extended in accordance with the axis of rotation, and a yoke, and protruded on a hoop direction via a predetermined interval at a yoke, Rotor winding which consists of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between a suspending portion, a suspending portion, and a yoke which were formed in the radial outer diameter side of a magnetic pole iron core, In a salient pole form rotator provided with an insulating member arranged between rotor winding, a yoke, and a magnetic pole iron core, two or more blow holes which penetrate rotor winding, an insulating member, and a suspending portion to shaft orientations of rotor winding are provided along a winding direction of rotor winding.

[0007]Two or more magnetic pole iron cores which a salient pole form rotator of this invention extended along with a yoke which extended in accordance with the axis of rotation, and a yoke, and protruded on a hoop direction via a predetermined interval at a yoke, Rotor winding which consists of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between a suspending portion, a suspending portion, and a yoke which were formed in the radial outer diameter side of a magnetic pole iron core, In a salient pole form rotator provided with an insulating member arranged between rotor winding, a yoke, and a magnetic pole iron core, Two or more ventilation flues formed in a shaft direction by extending at rotor winding of a yoke and a corresponding corner and blow holes which penetrate rotor winding, an insulating member, and a suspending portion in the direction of winding of rotor winding are provided along a winding direction of rotor winding.

[0008]A salient pole form rotator of this invention uses a blow hole as an oblong hole long to a winding direction of rotor winding. A salient pole form rotator of this invention arranges a blow hole by plural lines to a diameter direction of rotor winding. Two or more tabular conductors to which weldbonding of the ends was carried out in rotor winding constitute a salient pole form rotator of this invention.

[0009]A salient pole form rotator of this invention forms a ventilation flue by rotor winding which adjoins a notch section formed in shaft orientations by extending at rotor winding of a yoke, and a corresponding corner. A salient pole form rotator of this invention provides an air seal among both rotor winding so that a crevice between adjacent rotor winding may be closed.

[0010]A salient pole form rotator of this invention consists of an open hole and the 2nd blow hole open for free passage by penetrating the 1st blow hole of a large number which penetrate rotor winding for a blow hole, two or more open holes which open a predetermined number of 1st blow hole for free passage among many 1st blow hole, respectively, and a suspending portion of a magnetic pole iron core.

[0011]A salient pole form rotator of this invention forms an open hole in an insulating member by the side of a suspending portion of a magnetic pole iron core. A salient pole form rotator of this invention constitutes rotor winding from an inner winding wire and outside winding, and forms a blow hole in an inner winding wire and outside winding, respectively.

[0012]A salient pole form rotator of this invention makes a size of shaft orientations of rotor winding of

outside winding shorter than a size of the above-mentioned shaft orientations of an inner winding wire, and forms a step in the ventilation flue side of rotor winding. A salient pole form rotator of this invention provides a notch section in a hand of cut of a rotator of an opening of a blow hole of a suspending portion, and a position of an opposite hand.

[0013]Two or more magnetic pole iron cores where a salient pole form rotator of this invention extended along with a yoke which extended in accordance with the axis of rotation, and a yoke, it protruded [at] on the above-mentioned yoke via a predetermined interval in a hoop direction, and a suspending portion was formed in a tip part, In a salient pole form rotator provided with an insulating member arranged between rotor winding, rotor winding, a yoke, and a magnetic pole iron core which consist of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between a suspending portion of a magnetic pole iron core, and a yoke, Rotor winding is constituted from an inner winding wire and outside winding, and an insulating member between winding which provided two or more slots which counter with an inner winding wire and outside winding between an inner winding wire and outside winding, and extend in shaft orientations of rotor winding is arranged.

[0014]Two or more magnetic pole iron cores where a salient pole form rotator of this invention extended along with a yoke which extended in accordance with the axis of rotation, and a yoke, it protruded [at] on a yoke via a predetermined interval in a hoop direction, and a suspending portion was formed in a tip part, In a salient pole form rotator provided with an insulating member arranged between rotor winding, rotor winding, a yoke, and a magnetic pole iron core which consist of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between a suspending portion of a magnetic pole iron core, and a yoke, Rotor winding is constituted from an inner winding wire and outside winding, and sectional shape of a diameter direction of rotor winding arranges a wave-like insulating member between winding between an inner winding wire and outside winding.

[0015]A salient pole form rotator of this invention is constituted by pressing part which contacts pars intermedia which connects between adjacent rotor winding, and the above-mentioned rotor winding, and provides a coil presser foot bound tight and fixed to a yoke by a clamping bolt. A windhole which has the 2nd page that contacts between adjacent rotor winding, and is penetrated to a shaft direction is formed, and a salient pole form rotator of this invention provides a coil presser foot bound tight and fixed to a yoke by a clamping bolt. A salient pole form rotator of this invention arranges a blow hole by 2-4 rows to a diameter direction of rotor winding.

[0016]

[Embodiment of the Invention]The perspective view showing the salient pole form rotator according [embodiment 1. drawing 1] to this embodiment of the invention 1, the sectional view of the salient pole form rotator which shows drawing 1 drawing 2, and drawing 3 are the perspective views of the rotor winding with which the salient pole form rotator shown in drawing 1 was equipped. In a figure, 12 extends in the shaft orientations of the axis of rotation 13, and as shown in drawing 2, the notch section 14 is formed in each square corner, The yoke by which the connecting part 12a was formed in each side part, and 15 extend in a shaft direction along with the yoke 12, Four magnetic pole iron cores which protruded by connecting with a hoop direction via a predetermined interval at each connecting part 12a of the yoke 12 mutually, and 15a are the suspending portions formed in the radial outer diameter side of the magnetic pole iron core 15 at one.

[0017]18 is the rotor winding with which it was equipped so that the magnetic pole iron core 15 might be surrounded between the suspending portion 15a of the magnetic pole iron core 15, and the yoke 12,

and is constituted by the tabular conductor 18a laminated via the insulating member (not shown). They are a top insulating member by which 19 has been arranged between the rotor winding 18 and the suspending portion 15a, an inside insulating member by which 20 has been arranged between the inner skin of the rotor winding 18, and the magnetic pole iron core 15, and a pars-basilaris-ossis-occipitalis insulating member by which 21 has been arranged at the bottom of the rotor winding 18, The insulating member 22 is constituted with the top insulating member 19 and the internal insulating member 20. The ventilation flue 23 is formed of each adjacent bottom and the notch section 14 of the rotor winding 18.

[0018]24 is the air seal which extended in the shaft direction so that the crevice between the adjacent rotor winding 18 may be closed, and it is being connected and fixed between both the partes-basilaris-ossis-occipitalis insulating members 21. Two or more 25 is arranged via a predetermined interval in the shaft direction of the rotor winding 18, the rotor winding 18, the insulating member 22, and the suspending portion 15a are penetrated to the shaft orientations of the rotor winding 18, and it is a blow hole which opens a way for free passage outside the ventilation flue 23 and the suspending portion 15a, The sectional shape is an oblong hole long in the direction of winding of the rotor winding 18. In the position corresponding to the end of the shaft direction of the rotor winding 18, 26 is the blow hole which penetrated the rotor winding 18, the insulating member 22, and the suspending portion 15a to the shaft orientations of the rotor winding 18, and has become an oblong hole where sectional shape is long in the direction of winding of the rotor winding 18.

[0019]The pars intermedia 27a arranged as between the adjacent rotor winding 18 connected in 27, The coil presser foot constituted by the pressing part 27b of the couple which extends from the both ends of the pars intermedia 27a in the direction which keeps away from the yoke 12, and counters with the rotor winding 18 via the presser-foot board 28, 29 is a clamping bolt which penetrates the pars intermedia 27a of the coil presser foot 27, binds the coil presser foot 27 tight to the yoke 12, and is fixed, It has prevented that press down the coil presser foot 27, push against the rotor winding 18 via the board 28, and the rotor winding 18 changes by the component of a force of the centrifugal force generated by rotation of a salient pole form rotator.

[0020]Next, operation of the salient pole form rotator in Embodiment 1 constituted as mentioned above is explained. The cooling wind blows sent during the rotating operation of a salient pole form rotator in a shaft direction flow into the blow hole 26 of the end of the shaft direction of the rotor winding 18, and flow into a way outside the magnetic pole iron core 15 through the blow hole 26. The end of the shaft direction of the rotor winding 18 is cooled with sufficient balance by the flow of these cooling wind blows. Since ventilation flue 26 sectional shape serves as an oblong hole, cooling wind blows can enlarge area in contact with the rotor winding 18, and can cool the rotor winding 18 efficiently.

[0021]The cooling wind blows sent during the rotating operation of a salient pole form rotator in the shaft direction flow into each ventilation flue 23. And the cooling wind blows which flowed in the ventilation flue 23 are shunted to each blow hole 25 in the process in which it flows through the inside of the ventilation flue 23, and flow into a way outside the suspending portion 15a through each blow hole 25. The flank which extends in the shaft direction of the rotor winding 18 is efficiently cooled with sufficient balance like the above by the flow of these cooling wind blows. Since the cooling wind blows which flow into a shaft direction between the adjacent rotor winding 18 pass along between both the pressing parts 27b of the coil presser foot 27, they can raise the chilling effect of the rotor winding 18.

[0022]Although the path lock part 15a was formed in one at the radial outer diameter side of the magnetic pole iron core 15 and the so-called salient pole form rotator of the dovetail method which

protruded the magnetic pole iron core 15 on the yoke 12 by connecting the magnetic pole iron core 15 with the connecting part 12a of the yoke 12 was explained in the above-mentioned Embodiment 1, This invention protrudes the magnetic pole iron core 15 on the yoke 12 by forming not only this but the magnetic pole iron core 15 in the yoke 12 and one, and. Even if it applies to the salient pole form rotator of the pole-shoe method which formed the suspending portion 15a by connecting the suspending portion 15a with the radial outer diameter side of the magnetic pole iron core 15 with a bolt (not shown), there is same effect. In the above-mentioned Embodiment 1, although the salient pole form rotator of four poles was explained, even if six poles and eight poles apply this invention, it has the same effect, for example not only except this but except 4 poles.

[0023]The perspective view showing the salient pole form rotator according [embodiment 2. drawing 4] to this embodiment of the invention 2 and drawing 5 are the perspective views showing the rotor winding provided in the salient pole form rotator shown in drawing 4. In a figure, also in the above-mentioned Embodiment 1, the same portion attaches identical codes and omits explanation. 30a and 30b are the ventilation flues which penetrated the rotor winding 30 to shaft orientations, and are arranged in accordance with the direction of winding in the diameter direction of the rotor winding 30 by two rows. And like the salient pole form rotator in the above-mentioned Embodiment 1, during the rotating operation of a salient pole form rotator, cooling wind blows flow into the blow hole 30a directly from the axis-of-rotation 13 side of the rotor winding 30, and cooling wind blows flow through the ventilation flue 23 in the blow hole 30b.

[0024]In the above-mentioned Embodiment 2, since the blow holes 30a and 30b are arranged at two rows, the touch area of the cooling wind blows and the rotor winding 30 which flow through the blow holes 30a and 30b can be increased, a chilling effect can be heightened, and the rotor winding 30 can be uniformly cooled to a diameter direction. In the above-mentioned Embodiment 2, although what has arranged the blow holes 30a and 30b to two rows was explained, if the row number of the blow holes 30a and 30b is increased, the touch area of cooling wind blows and the rotor winding 30 will increase, and a chilling effect will improve further. However, if the row number of the blow holes 30a and 30b is made not much large, the electrical resistance of the rotor winding 30 will increase and calorific value will increase. The problem that the mechanical strength of the rotor winding 30 falls arises. If these problems are taken into consideration, it is appropriate for the row number of the blow holes 30a and 30b to consider it as 2-4 rows. In the above-mentioned Embodiment 2, although the blow holes 30a and 30b are put in order and arranged in the diameter direction of the rotor winding 18, even if it arranges the blow holes 30a and 30b alternately, there is same effect.

[0025]Embodiment 3. drawing 6 is a perspective view showing a part of rotor winding of the salient pole form rotator by this embodiment of the invention 3. In the figure, it is rotor winding, and 31 carries out weldbonding of the tip of the tabular conductor 31a to the end side of the tabular conductor 31b, by carrying out weldbonding of the tip of the tabular conductor 31c to the end side of 31 d of tabular conductors, it is formed in a coiled form and constituted by accumulating two or more steps by turns. 32a and 32b are the blow holes which penetrated the rotor winding 31, and are arranged by two rows in the diameter direction of the rotor winding 31. And if the rotor winding 31 is shown in drawing 4, a magnetic pole iron core is equipped similarly and the **** form rotator is constituted.

[0026]Since it is manufactured in the above-mentioned Embodiment 3 when the rotor winding 31 carries out weldbonding of the tabular conductors 31a-31d, Since the process of bending a tabular conductor to a coiled form is not needed and the spooling machine which bends a tabular conductor and manufactures

rotor winding is not needed, it is advantageous when manufacturing rotor winding especially using a broad tabular conductor.

[0027]The sectional view showing the composition of the important section of the salient pole form rotator according [embodiment 4. drawing 7] to this embodiment of the invention 4 and drawing 8 are the perspective views showing the rotor winding shown in drawing 7. In a figure, also in the above-mentioned Embodiment 1, the same portion attaches identical codes and omits explanation. 33 is rotor winding and is constituted by the inner winding wire 33b and the outside winding 33c which were formed by the tabular conductor 33a, respectively. As the insulating member between winding by which 34 has been arranged between the inner winding wire 33b and the outside winding 33c, and 35a are the blow holes which penetrated the inner winding wire 33b and are shown in drawing 8, in accordance with the direction of winding of the rotor winding 33, more than one are provided in the inner winding wire 33b. 35b is the blow hole which penetrated the outside winding 33c, and as shown in drawing 8, it is provided in the outside winding 33c in accordance with the direction of winding of the rotor winding 33. [two or more]

[0028]Since according to the Embodiment 4 constituted as mentioned above it is cooled by the cooling wind blows into which the inner winding wire 33b flows through the blow hole 35a and the outside winding 33c is cooled by the cooling wind blows which flow through the blow hole 35b, the inner winding wire 33b and the outside winding 33c can be cooled uniformly. By constituting the rotor winding 33 by the inner winding wire 33b and the outside winding 33c, width of the tabular conductor 33a can be made into a half compared with the case where rotor winding is constituted from one winding, and the bending work of a tabular conductor becomes easy.

[0029]Embodiment 5. drawing 9 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 5. In a figure, also in the above-mentioned embodiment, the same portion attaches identical codes and omits explanation. By 36 being rotor winding, being constituted from the inner winding wire 36a and the inner winding wire 36a by the outside winding 36b with the short length of the shaft orientations of the rotor winding 36, and retracting the end by the side of the ventilation flue 23 of the outside winding 36b from the end of the inner winding wire 36a, The step 37 is formed in the ventilation flue 23 side of the rotor winding 36.

[0030]Since rotor winding 36 comrades which adjoin each other since the step 37 is formed in the rotor winding 36 at the ventilation flue 23 side according to the above-mentioned Embodiment 5 are brought close and the space between rotor winding 36 can be made small, the miniaturization of a salient pole form rotator is possible.

[0031]Embodiment 6. drawing 10 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 6. In a figure, also in the above-mentioned Embodiment 4, the same portion attaches identical codes and omits explanation. The 1st blow hole where 38a penetrated the top insulating member 19, the inner winding wire 33b, and the pars-basilaris-ossis-occipitalis insulating member 21, The 1st blow hole where 38b penetrated the top insulating member 19, the outside winding 33c, and the pars-basilaris-ossis-occipitalis insulating member 21, 39a is provided in the suspending portion 15a of the magnetic pole iron core 15, and they are both the 1st blow hole 38a, an open hole which opens 38b for free passage, and the 2nd blow hole that 39b penetrates the path lock part 15a of the magnetic pole iron core 15, and opens the open hole 39a and the way outside the suspending portion 15a for free passage. And the blow hole 40 is constituted by the 1st

blow hole 38a and 38b of the above, the open hole 39a, and the 2nd blow hole 39b.

[0032]In Embodiment 6 constituted as mentioned above, Since there may be the 2nd one blow hole 39b to the 1st two blow holes 38a and 38b, The number of the blow hole which penetrates the magnetic pole iron core 15 can be lessened, and even if the sectional shape of the 1st blow hole 38a and 38b that penetrates the rotor winding 33 is an oblong hole, a drilling process can make circular easily sectional shape of the 2nd blow hole 39b.

[0033]Embodiment 7. drawing 11 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 7. In a figure, also in the above-mentioned Embodiment 1, the same portion attaches identical codes and omits explanation. Two or more 1st blow holes that 41a, 41b, and 41c have been arranged in accordance with the direction of winding of the rotor winding 42, and penetrated the rotor winding 42, the upper part, and the pars-basilaris-ossis-occipitalis insulating members 19 and 21, They are an open hole which 43a is provided in the suspending portion 15a of the magnetic pole iron core 15, and opens each 1st blow hole 41a, 41b, and 41c for free passage, and the 2nd blow hole that 43b penetrates the path lock part 15a of the magnetic pole iron core 15, and opens the open hole 43a and the way outside the suspending portion 15a for free passage. And the blow hole 44 is constituted by the 1st blow hole 41a, 41b, and 41c of the above, the open hole 43a, and the 2nd blow hole 43b.

[0034]In the above-mentioned Embodiment 7, since there may be the 2nd one blow hole 43b to two or more 1st blow holes 41a, 41b, and 41c, The number of the blow hole which penetrates the magnetic pole iron core 15 can be lessened, and even if the sectional shape of the 1st blow hole 41a, 41b, and 41c that penetrates the rotor winding 42 is an oblong hole, a drilling process can make circular easily sectional shape of the 2nd ventilation 43b.

[0035]Embodiment 8. drawing 12 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 8. In a figure, also in the above-mentioned Embodiment 4, the same portion attaches identical codes and omits explanation. The 1st blow hole where 45a penetrated the inner winding wire 33b and the pars-basilaris-ossis-occipitalis insulating member 21, The 1st blow hole where 45b penetrated the outside winding 33c and the pars-basilaris-ossis-occipitalis insulating member 21, 46 penetrates both the 1st blow hole 45a and 45b of the top insulating member 19, and a corresponding position, and they are both the 1st blow hole 45a and 45b, an open hole open for free passage, and the 2nd blow hole that 47 penetrates the suspending portion 15a of the magnetic pole iron core 15, and opens the open hole 46 and the way outside the suspending portion 15a for free passage. And the blow hole 48 is constituted by the 1st blow hole 45a and 45b of the above, the open hole 46, and the 2nd blow hole 47.

[0036]In Embodiment 8 constituted as mentioned above, since there may be the 2nd one blow hole 47 to the 1st two blow holes 45a and 45b, the number of the blow hole which penetrates the magnetic pole iron core 15 can be lessened. Even if the sectional shape of the 1st blow hole 45a and 45b that penetrates the rotor winding 33 is an oblong hole, a drilling process can make sectional shape of the 2nd ventilation 47 circular easily. Since the open hole 46 was formed in the top insulating member 19, it is not necessary to establish the open hole 46 in the suspending portion 15a of the magnetic pole iron core 15, and processing is easy.

[0037]Embodiment 9. drawing 13 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 9. In a figure, also in the above-mentioned Embodiment 7, the same portion attaches identical codes and omits explanation. Two or more 1st blow

holes that 49a, 49b, and 49c have been arranged in accordance with the direction of winding of the rotor winding 50, and penetrated the rotor winding 50 and the pars-basilaris-ossis-occipitalis insulating member 21, 51 penetrates the 1st blow hole 49a, 49b, and 49c of the top insulating member 19, and a corresponding position, and they are the 1st blow hole 49a and 49b, an open hole which opens between 49c for free passage, and the 2nd blow hole that 52 penetrates the suspending portion 15a of the magnetic pole iron core 15, and opens the open hole 51 and the way outside the magnetic pole iron core 15 for free passage. The 1st blow hole 49a, 49b, and 49c of the above, the open hole 51, and the 2nd are caused blow hole 52, and the blow hole 53 is constituted.

[0038]In Embodiment 9 constituted as mentioned above, Since there may be the 2nd one blow hole 52 to two or more 1st blow holes 49a, 49b, and 49c, The number of the blow hole which penetrates the magnetic pole iron core 15 can be lessened, and even if the sectional shape of the 1st blow hole 49a, 49b, and 49c that penetrates the rotor winding 50 is an oblong hole, a drilling process can make circular easily sectional shape of the 2nd blow hole 52. Since the open hole 51 was formed in the top insulating member 19, it is not necessary to establish the open hole 51 in the suspending portion 15a, and processing is easy.

[0039]Although what opened between the 1st blow hole 49a and 49b and 49c for free passage in the above-mentioned Embodiment 9 by the open hole 51 which penetrated the top insulating member 19 was explained, Even if not only this but the 1st blow hole 49a, 49b, and 49c constitutes so that mutual may be open for free passage within the rotor winding 50 in the end by the side of the suspending portion 15a of the rotor winding 50, it is effective in the ability to lessen the number of the blow hole which penetrates the magnetic pole iron core 15.

[0040]The top view of rotor winding used for the salient pole form rotator according [embodiment 10. drawing 14] to this embodiment of the invention 10 and drawing 15 are the perspective views showing a part of insulating member between winding shown in drawing 14. In the figure, 54 is rotor winding and comprises the inner winding wire 54a and the outside winding 54b. 55 is an annular insulating member between winding which is arranged between the inner winding wire 54a and the outside winding 54b, and maintains the interval between both the winding 54a and 54b, and two or more slots 55a which extended in the shaft orientations of the rotor winding 54 as shown in drawing 15 are established in the inside-and-outside both sides. And two or more blow holes 55b which penetrate the rotor winding 54 as shown in drawing 14 are formed of this slot 55a.

[0041]The rotor winding 54 formed as mentioned above can pass cooling wind blows to each blow hole 55b by [so that a salient pole form rotator may be equipped like drawing 13 for example, and the 3-4 adjoining winding ventilation flues 55b may be open for free passage with the one open hole 51 shown in drawing 13 / which constitute]. In Embodiment 10 constituted as mentioned above, Since the blow hole 55b is formed of the slot 55a established in the insulating member 55 between winding, Since many blow holes 55b can be established in the diameter direction center section of the rotor winding 54 in accordance with the direction of winding of the rotor winding 54, without making the inside and the outside winding 56a and 56b penetrate a blow hole, Even if it forms many blow holes 55b, there is no possibility that the problem that the electrical resistance of the rotor winding 54 rises may arise, and the rotor winding 54 can be cooled efficiently.

[0042]Embodiment 11. drawing 16 is a top view of rotor winding used for the salient pole form rotator by this embodiment of the invention 11. In the figure, 56 is rotor winding and comprises the inner

winding wire 56a and the outside winding 56b. 57 is an annular insulating member between winding arranged between the inner winding wire 56a and the outside winding 56b, and the sectional shape of the diameter direction of the rotor winding 56 is formed in the waveform. 58 is a blow hole of a large number formed between the insulating member 57 between winding, and the inner winding wire 56a, and between the insulating member 57 between winding, and the outside winding 56c.

[0043]When the sectional shape arranged between the inner winding wire 56a and the outside winding 56b arranges the wave-like insulating member 57 between winding according to the Embodiment 11 constituted as mentioned above, Since many blow holes 58 can be formed in accordance with the direction of winding of the rotor winding 56, even if it forms many blow holes 55b, there is no possibility that the problem that the electrical resistance of the rotor winding 54 rises may arise. Since the cooling wind blows which flow through the blow hole 58 can enlarge area in contact with the peripheral face of the inner winding wire 56a, and the inner skin of the outside winding 56b, a chilling effect can be raised.

[0044]Embodiment 12. drawing 17 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 12. In a figure, also in the above-mentioned Embodiment 1, the same portion attaches identical codes and omits explanation. The arrow A shows the hand of cut of the salient pole form rotator. 59 is the notch section formed so that it might incline in the hand of cut A and an opposite hand in the hand of cut A of the opening 15b and the position of an opposite hand in which the blow hole 60 carries out an opening. In the above-mentioned Embodiment 12, since the rise of the pneumatic pressure produced near the opening 15b by rotation of a salient pole form rotator is eased by the notch section 59, cooling wind blows flow out of the blow hole 60 easily, cooling wind blows become easy to flow through the blow hole 60, and the chilling effect by cooling wind blows improves.

[0045]Although the two blow holes 60 explained what penetrated the suspending portion 15a individually in the above-mentioned Embodiment 12, For example, as shown in drawing 10, the open hole 39a and the 2nd blow hole 39b are established in the suspending portion 15a, and even if it applies the portion which penetrates the suspending portion 15a of the blow hole 40 to what was summarized to one, there is same effect.

[0046]Embodiment 13. drawing 18 is a sectional view showing the important section of the salient pole form rotator by this embodiment of the invention 13. In a figure, also in the above-mentioned Embodiment 1, the same portion attaches identical codes and omits explanation. 61 is the coil presser foot which it has been arranged between the adjacent rotor winding 18, and 61a and the windhole 61b penetrated to a shaft direction the 2nd page which press down to the both ends of the hoop direction of the axis of rotation, and contact the rotor winding 18 via the board 28 were formed, and was bound tight and fixed to the yoke 12 by the clamping bolt 29.

[0047]According to the Embodiment 13 constituted as mentioned above, since the cooling wind blows by which between the rotor winding 18 which adjoins each other during the rotating operation of a salient pole form rotator is sent to a shaft direction pass along the windhole 61b, they can raise the chilling effect of the rotor winding 18.

[0048]

[Effect of the Invention]Two or more magnetic pole iron cores which according to the salient pole form rotator of this invention extended along with the yoke which extended in accordance with the axis of rotation, and the yoke, and protruded on the hoop direction via the predetermined interval at the yoke,

The rotor winding which consists of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between the suspending portion, suspending portion, and yoke which were formed in the radial outer diameter side of a magnetic pole iron core, Since two or more blow holes which penetrate rotor winding, an insulating member, and a suspending portion to the shaft orientations of rotor winding were provided along the winding direction of rotor winding in the salient pole form rotator provided with the insulating member arranged between rotor winding, a yoke, and a magnetic pole iron core, The chilling effect by cooling wind blows can improve, and rotor winding can be cooled with sufficient balance.

[0049]The yoke which extended in accordance with the axis of rotation according to the salient pole form rotator of this invention, Two or more magnetic pole iron cores which extended along with the yoke and protruded on the hoop direction via the predetermined interval at the yoke, The rotor winding which consists of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between the suspending portion, suspending portion, and yoke which were formed in the radial outer diameter side of a magnetic pole iron core, In the salient pole form rotator provided with the insulating member arranged between rotor winding, a yoke, and a magnetic pole iron core, Since two or more ventilation flues formed in the shaft direction by extending at the rotor winding of a yoke and a corresponding corner and blow holes which penetrate rotor winding, an insulating member, and a suspending portion in the direction of winding of rotor winding were provided along the winding direction of rotor winding, The chilling effect of the shaft direction center section of the rotor winding by cooling wind blows can be raised, and rotor winding can be cooled with sufficient balance.

[0050]Since the blow hole was used as the oblong hole long to the winding direction of rotor winding according to the salient pole form rotator of this invention, the touch area of cooling wind blows and rotor winding can be enlarged, and a chilling effect can be heightened.

[0051]Since the blow hole has been arranged by plural lines to the diameter direction of rotor winding according to the salient pole form rotator of this invention, the touch area of cooling wind blows and rotor winding can be enlarged, and a chilling effect can be heightened.

[0052]Since ends constituted rotor winding by two or more tabular conductors by which weldbonding was carried out according to the salient pole form rotator of this invention, it is not necessary to wind a tabular conductor around manufacturing rotor winding, and it becomes easy to manufacture rotor winding by a wide tabular conductor.

[0053]Since the ventilation flue was formed by the notch section formed in shaft orientations by extending at the rotor winding of a yoke, and a corresponding corner, and adjacent rotor winding according to the salient pole form rotator of this invention, the ventilation flue which extended in the shaft direction of the yoke can be formed easily.

[0054]Since it prevented that provide an air seal among both rotor winding so that the crevice between adjacent rotor winding may be closed, and cooling wind blows flowed out of the middle in a ventilation flue according to the salient pole form rotator of this invention, it can flow into a blow hole, ****** air capacity can be made to be able to increase, and a chilling effect can be raised.

[0055]The 1st blow hole of a large number which penetrate rotor winding for a blow hole according to the salient pole form rotator of this invention, By penetrating two or more open holes which open a predetermined number of 1st blow hole for free passage among many 1st blow hole, respectively, and the suspending portion of a magnetic pole iron core, since it constituted from an open hole and the 2nd blow hole open for free passage, Since there may be the 2nd one blow hole to two or more 1st blow

holes, even when the sectional shape of the 1st blow hole that the number of the blow hole which penetrates a magnetic pole iron core can be lessened, and penetrates rotor winding is an oblong hole, a drilling process can make sectional shape of the 2nd ventilation easy shape.

[0056]Since the open hole was formed in the insulating member by the side of the suspending portion of a magnetic pole iron core according to the salient pole form rotator of this invention, Since the number of the blow hole which penetrates the suspending portion of a magnetic pole iron core can be lessened and it becomes unnecessary to establish an open hole in the suspending portion of a magnetic pole iron core, processing can make easy shape sectional shape of the blow hole which penetrates a suspending portion.

[0057]Since according to the salient pole form rotator of this invention rotor winding was constituted from an inner winding wire and outside winding and the blow hole was formed in an inner winding wire and outside winding, respectively, an inner winding wire and outside winding can be cooled uniformly.

[0058]Since according to the salient pole form rotator of this invention the size of the shaft orientations of the rotor winding of outside winding was made shorter than the size of the above-mentioned shaft orientations of an inner winding wire and the step was formed in the ventilation flue side of rotor winding, adjacent rotor winding is brought close and it is effective in the ability to miniaturize a salient pole form rotator.

[0059]Since the notch section was provided in the hand of cut of the rotator of the opening of the blow hole of a suspending portion, and the position of the opposite hand according to the salient pole form rotator of this invention, The rise of the pneumatic pressure produced near the opening by rotation of a salient pole form rotator is eased, cooling wind blows flow out of a blow hole easily, cooling wind blows become easy to flow through a blow hole, and the chilling effect by cooling wind blows improves.

[0060]The yoke which extended in accordance with the axis of rotation according to the salient pole form rotator of this invention, Two or more magnetic pole iron cores where it extended along with the yoke, and protruded on the hoop direction via the predetermined interval at the above-mentioned yoke, and the suspending portion was formed in the tip part, In the salient pole form rotator provided with the insulating member arranged between the rotor winding, the rotor winding, yoke, and magnetic pole iron core which consist of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded between the suspending portion of a magnetic pole iron core, and a yoke, Since the insulating member between winding in which two or more slots which comprise an inner winding wire and outside winding, counter with an inner winding wire and outside winding between an inner winding wire and outside winding, and extend rotor winding in the shaft orientations of rotor winding were established has been arranged, Since many blow holes can be established in the diameter direction center section of rotor winding in accordance with the direction of winding of rotor winding, without making the inside and outside winding penetrate a blow hole, Even if it provides many blow holes, there is no possibility that the problem that the electrical resistance of rotor winding rises may arise, and rotor winding can be cooled efficiently.

[0061]The yoke which extended in accordance with the axis of rotation according to the salient pole form rotator of this invention, Two or more magnetic pole iron cores where it extended along with the yoke, and protruded on the hoop direction via the predetermined interval at the yoke, and the suspending portion was formed in the tip part, In the salient pole form rotator provided with the insulating member arranged between the rotor winding, the rotor winding, yoke, and magnetic pole iron core which consist of a tabular conductor with which it was equipped so that a magnetic pole iron core might be surrounded

between the suspending portion of a magnetic pole iron core, and a yoke, Since rotor winding was constituted from an inner winding wire and outside winding and the insulating member between winding of a waveform [sectional shape / of the diameter direction of rotor winding] has arranged between an inner winding wire and outside winding, even if it provides many blow holes in accordance with the direction of winding of rotor winding, there is no possibility that the problem that the electrical resistance of rotor winding rises may arise. Since the cooling wind blows which flow through a blow hole can enlarge area in contact with the peripheral face of an inner winding wire, and the inner skin of outside winding, a chilling effect can be raised.

[0062]Since the coil presser foot which was constituted by the pressing part which contacts the pars intermedia which connects between adjacent rotor winding, and the above-mentioned rotor winding, and was bound tight and fixed to the yoke by the clamping bolt was provided according to the salient pole form rotator of this invention, Since the cooling wind blows which flow between adjacent rotor winding pass along the space between both the pressing parts of a coil presser foot, the chilling effect of the pars intermedia of the shaft direction of rotor winding can be raised.

[0063]Since the coil presser foot which the windhole which has the 2nd page that contacts between adjacent rotor winding, and is penetrated to a shaft direction was formed, and was bound tight and fixed to the yoke by the clamping bolt was provided according to the salient pole form rotator of this invention, Since the cooling wind blows which flow into a shaft direction between adjacent rotor winding flow through a windhole, they can raise the chilling effect from the outside of rotor winding.

[0064]Since the blow hole has been arranged by 2-4 rows to the diameter direction of rotor winding according to the salient pole form rotator of this invention, the touch area of cooling wind blows and rotor winding can be enlarged, and a chilling effect can be heightened.

[Translation done.]